CLAIMS:

1. A single wall carbon nanotube derivatized with substituents covalently bonded to carbon atoms of the side wall of the nanotube.

2. The single wall carbon nanotube of claim 1, wherein the substituents are selected from fluorine, alkyl and phenyl.

3. The single wall nanotube of claim 1, wherein fluorine is covalently bonded to the side wall of the nanotube, said nanotube having high electrical resistance.

4. A method for derivatizing carbon nanotubes comprising reacting carbon nanotubes with fluorine gas.

5. The method of claim 4, wherein the fluorine gas is free of HF.

6. The method of claim 5, wherein the reaction temperature is less than 500°C, preferably less than 400°C.

7. The method of claim 4, wherein fluorine is reacted with single wall carbon nanotubes and the product is multiple wall carbon nanotubes having fluorine covalently attached thereto.

8. The method of claim 7, wherein the temperature of the reaction is at least 500°C.

9. The method of claim 4, wherein the product of the reaction is single wall carbon nanotubes having fluorine covalently attached to the sidewall of the nanotubes.

10. A method for preparing single wall carbon nanotubes having substituents attached to the side wall of the nanotube comprising:

a) reacting single wall carbon nanotubes with fluorine gas;

b) recovering fluorine derivatized carbon nanotubes;

c) reacting fluorine derivatized carbon nanotubes with a nucleophile; and

d) recovering single wall carbon nanotubes with substituents covalently bonded to carbon atoms of the side wall of the nanotubes.

11. A method of solvating single wall nanotubes (SWNT) comprising

a) fluorinating a plurality of SWNT; and

b) sonicating said plurality of fluorinated SWNT in a solvent.

12. The method of claim 11, wherein said solvent is an alcohol.

13. A method for derivatizing the side wall of a single wall nanotube comprising

a) fluorinating a SWNT;

b) dispersing the fluorinated SWNT in a solvent; and

c) reacting the dispersed SWNT with a nucleophile.

14 The method of claim 13, wherein the nucleophile is an organometallic compound.

15. The method according to claim 14, wherein said organometallic compound is a substituted or unsubstituted alkyl or aryl compound of an alkali metal, said compound having from 1 to 20 carbon atoms.

16. The method according to claim 15, wherein the alkali metal is sodium or lithium.

17. The method according to claim 13, further comprising removing residual fluorine and other alkali or alkaline earth metals from the SWNT subsequent to reaction with the nucleophile.

18. An array of single-wall nanotubes for the catalytic production of assemblies of single wall carbon nanotubes comprising a plurality of single wall carbon nanotubes assembled in a generally parallel configuration, said nanotubes being of approximately equal length and each having at least one free end, wherein on the side wall of each said single wall carbon nanotube is disposed a quantity of physisorbed or covalently bonded transition metal catalyst precursor moieties sufficient to provide active catalyst metal atom clusters to grow single wall carbon nanotubes under conditions that promote the generation of metal atoms and the migration of said metal atoms to the free ends of said single wall carbon nanotubes.